A Performance Index for the DOE Pollution Prevention, Energy Efficiency Leadership Goals

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Summary. On November 12, 1999, the Secretary of Energy issued 19 Pollution Prevention, Energy Efficiency (P2E2) Leadership Goals for the years 2005 and 2010. By early 2001 each DOE site developed a baseline for computing performance toward each 2005 goal and a plan for achieving the 2005 goals. The EFCOG Environmental Subgroup was asked by the DOE Safety Management Integration Team (SMIT) to develop a pollution prevention performance indicator. This indicator is to be an environmental analog to Lost Workday Cases and Total Reportable Injuries (LWC/TRI) indicators used to quantify safety performance. The EFCOG developed a single index that quantifies performance toward achieving the 17 P2E2 Leadership goals for 2005. It can be computed for DOE as a whole, for each PSO, each Ops Office, and each site.

Assumptions.

1. DOE will specify the conditions that determine whether a goal applies to a specific site, ops office or PSO. For example, sites that don't report a particular waste type in the DOE Annual Report won't include minimization of that waste type in their site-level index.
2. Each site, ops office, and PSO will compute their site-, office-, or program-level index from their raw performance data and not as a roll-up of subordinate-organization's indices.

Computing index values. The index is expressed as a percentage. It is an average of a percentage score for each of the 17 DOE goals. For goals referenced to a baseline year, 0% equates to no improvement and 100% equates to achieving the goal. For percentage performance goals (e.g. recycle 45% of sanitary waste), 0% equates to zero performance (e.g. no recycling) while 100% equates to achieving the goal (e.g. 45% recycling). Note, for all goals, except Goals 6 & 9, it is possible to achieve scores greater than 100% by exceeding the goal. At the DOE-wide level, 100% is the maximum value for each goal. At the site level, a greater than 100% maximum value could be allowed to credit sites that exceed the goal. In the example below, 150% maximum was used.

Reducing Waste and Recycling

Goal 1a: Reduce routine Hazardous waste by 90% compared to a 1993 CY baseline. Index-1a is (1 minus the current year routine hazardous waste generation divided by 1993 routine hazardous waste generation) divided by 0.9.

Goal 1b: Reduce routine low-level radioactive waste (LLW) by 80% compared to 1993 CY baseline. Index-1b is (1 minus the current year, routine LLW generation divided by 1993 routine LLW waste generation) divided by 0.8.

Goal 1c: Reduce routine mixed low-level radioactive waste (MLLW) by 80% compared to 1993 CY baseline. Index-1c is (1 minus the current year, routine MLLW generation divided by 1993 routine MLLW generation) divided by 0.8.

Goal 1d: Reduce routine non-mixed and mixed transuranic waste (TRU) by 80% compared to 1993 baseline. Index-1d is (1 minus the current year, routine TRU generation divided by 1993 routine TRU generation) divided by 0.8)

Goal 2: Reduce toxic chemicals subject to TRI reporting by 90%, using a 1993 baseline. Index-2 is (1 minus the # of current year TRI chemicals reported divided by the 1993 # of TRI chemicals) divided by 0.9.

Goal 3: Reduce sanitary waste from routine operations by 75% by 2005, using a 1993 baseline. Index-3 (1 minus the current year, routine sanitary waste generation divided by the 1993 routine sanitary waste generation) divided by 0.75.

Goal 4: Recycle 45% of sanitary wastes from all operations by 2005. Index-4 is the current year sanitary waste recycling fraction divided by 0.45.

Goal 5: Reduce waste resulting from cleanup, stabilization, and decommissioning activities by 10% on an annual basis compared to waste generation projected in the Environmental Restoration program baseline. Index-5 is the current year cleanup, stabilization and decommissioning fractional waste reduction divided by 0.1.

Buying Items with Recycled Content

Goal 6: Increase purchases of EPA-designated items with recycled content to 100%, except when not available competitively at reasonable price or that do not meet performance standards. Index-6 is (the value of EPA-designated items purchased with recycled-content plus the value of items purchased that were justified as not purchasable with recycled-content) divided by the value of all EPA-designated items purchased.

Improving Energy Usage

Goal 7a: Reduce energy consumption through life-cycle cost effective measures by 40% per gross square foot for buildings, using a 1985 baseline. Index-7a is (1 minus the current year energy consumption per square foot divided by 1985 energy consumption per square foot for buildings) divided by 0.4.

Goal 7b: Reduce energy consumption through life-cycle cost effective measures by 20% per gross square foot, or per other unit as applicable, for laboratory and industrial facilities, using a 1990 baseline. Index-7b is (1 minus the current year energy consumption per square foot divided by the 1990 energy consumption per square foot for laboratory and industrial facilities) divided by 0.2.

Goal 8a: Increase the purchase of electricity from clean energy sources; increase the purchase of electricity from renewable energy sources by including provisions for such purchase as a component of our request for bids in 100% of all future DOE competitive solicitations for electricity. Index-8a is the fraction of current year energy procurement where the request for bids included a requirement for energy from renewable energy sources.

(**Goal 8b:** Increase the purchase of electricity from clean energy sources; increase the purchase of electricity from less greenhouse gas-intensive sources, including but not limited to new advanced technology fossil energy systems and other highly efficient generating technologies. As this goal is not quantitative, it is not included in the index.)

Reducing Ozone Depleting Substances and Greenhouse Gases

Goal 9: Retrofit or replace 100% of chillers greater than 150 tons of cooling capacity and manufactured before 1984 that use class I refrigerants by 2005. Index-9 is (the tonnage of chillers using Class I ODSs in FY 2000 minus the current year tonnage of chillers using Class I ODSs) divided by the tonnage of chillers using Class I ODSs in FY 2000.

(**Goal 10:** Eliminate use of class I ozone depleting substances by 2010, to the extent economically practicable, and to the extent that safe alternative chemicals are available for DOE class I applications. Not included in the index because this is not a 2005 goal.)

Goal 11: Reduce greenhouse gas emissions attributed to facility energy use through life-cycle cost-effective measures by 25% by 2005, using 1990 as a baseline. Index-11 is (1 minus the greenhouse gas

emissions attributed to facility energy use in the current year divided by the greenhouse gas emissions attributed to facility energy use in 1990) divided by 0.25.

Increasing Vehicle Fleet Efficiency and Use of Alternative Fuels

Goal 12: Reduce our entire fleet's annual petroleum consumption by at least 20% by 2005 in comparison to 1999, including improving the fuel economy of new light duty vehicle acquisitions, and by other means. Index-12 is (1 minus the current annual fleet petroleum consumption divided by the 1999 annual fleet petroleum consumption) divided by 0.2.

Goal 13: Acquire each year at least 75% of light duty vehicles as alternative fuel vehicles, in accordance with the requirements of the Energy Policy Act of 1992. Index-13 is the fraction of light duty vehicle acquired each year that use alternative fuels divided by 0.75.

Goal 14: Increase the usage rate of alternative fuel in Departmental alternative fuel vehicles to 75% by 2005 in areas where alternative fuel infrastructure is available. Index-14 is the fraction of alternative fuel used in alternative fueled vehicles divided by 0.75.

An example.

Using the Los Alamos National Laboratory response to the recent call for baseline data for the P2E2 Leadership goals, we can calculate that Laboratory's current performance indices.

#	Goal Title	05 Goal % Reduction	Baseline	FY 00	05 Goal	Index
1a	Hazardous waste reduction	90	307 MT	22 MT	31 MT	103
1b	LLW reduction	80	1987 m3	401 m3	397 m3	100
1c	MLLW reduction	67	12.3 m3	5 m3	4 m3	89
1d	TRU waste reduction	0	77 m3	114 m3	77 m3	-48
2	TRI chemical use reduction	90	88,293#	26,057#	8,829#	78
3	Sanitary waste reduction	40	2228 MT	2353 MT	1337 MT	-14
4	Sanitary material recycling	45	N/A	9%	45%	20
5	Cleanup/stabilization waste reduction	10	N/A	25%	10%	150
6	Purchase of EPA designated items	100	N/A	93%	100%	93
7a	Reduce energy consumption-buildings	45	47 kWh/sqft	29 kWh/sqft	28 kWh/sqft	95
7b	Reduce energy consumption-labs/facs	N/A				
8a	Increase purchase of green electricity	N/A				
9	Replace ODS Class I chillers, >150T	100	3000 T	3000 T	0	0
11	Reduce greenhouse gas emissions	25	67,000 T	67,000 T	50,000 T	0
12	Reduce fleet petroleum usage	20	159 kgal	159 kgal	127 kgal	0
13	Acquire alternative fueled vehicles	62	N/A	46%	62%	74
14	Increase usage of alternative fuel	N/A				

LANL index = 53%, which is the average of the individual goal scores in the table above.

Notes.

1c. TRU waste minimization goal is to maintain waste generation at 93 level—as proposed to DOE.
1d & 3. When a site is exceeding its 1993 waste generation, the index value becomes negative.
4. Sanitary waste minimization goal is 40%--as proposed to DOE.
7a. Building energy usage is computed by subtracting the major energy using facilities from the total site usage and normalizing to total site square footage.

7b. Site buildings are not individually metered so it is not possible to determine an energy usage for laboratory and facility spaces.
8a. Electricity procurement is managed by DOE and not the site contractor.
11. A baseline was not available for reduction of greenhouse gas emissions, so a score of zero was entered in EPI-2. This is equivalent to using the current performance value as the baseline.
12. An FY 2000 value for petroleum was not available from GSA, so a score of zero was used. This is equivalent to using the FY 99 performance value for FY 2000.
13. A 62% new AFV procurement fraction was agreed with DOE/AL.

N/A in the baseline column means that the measure for that goal is self normalized and not referenced to a baseline.